

Total No. of Questions : 8]

SEAT No. :

**P1258**

**[5436]-11**

[Total No. of Pages : 2

**M.Sc.-I (Under Faculty of Science)**

**BOTANY**

**BO-1.1 : Systematics of Non Vascular Plants**

**(2008 Pattern) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer any five questions, taking at least two questions from each section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** Describe the concept, structural, Biochemical and molecular systematics. [16]

**Q2) a)** Explain range of thallus in chlorophyta. [8]

b) Give an account of heterocyst in cyanophyta. [8]

**Q3)** Write short answers of the following. [16]

a) Write a note on Indian Bryology.

b) Comment on algal reserve food.

**Q4)** Write short notes on any two of the following. [16]

a) Sexual reproduction in Rhodophyta

b) Gametophyte of Marchantiales

c) Algal habitats

***P.T.O.***

## SECTION-II

**Q5)** Give an account of Zygomycotina with reference to reproductive structures. [16]

**Q6) a)** Explain parasexuality and compatibility in fungi. [8]

b) Give life cycle pattern in Basidiomycotina. [8]

**Q7)** Write short answers of the following. [16]

a) Describe mycelium of fungi.

b) Explain spore producing organs in Ascomycotina.

**Q8)** Write short notes on any two of the following. [16]

a) Economic significance of Bryophytes.

b) Sporophyte of Sphagnum.

c) Evolution of Sex in fungi.

✓   ✓   ✓

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P1259**

**[5436] - 12**

**M.Sc. - I**

**BOTANY**

**BO - 1.2 : Plant Physiology and Biochemistry**

**(2008 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) Answer any five questions taking atleast two questions from each section.*
- 2) Answer to the two sections should be written in SEPARATE answer book.*
- 3) All questions carry equal marks.*
- 4) Neat diagrams must be drawn WHEREVER necessary.*

**SECTION - I**

**Q1)** Give an account of Photorespiration. Add a note on C<sub>4</sub> pathway.

**Q2)** Discuss:

- a) Biosynthesis of cytokinins.
- b) Abiotic stress in plants.

**Q3)** Explain:

- a) Nerst equation.
- b) Aquaporins

**Q4)** Write notes on Any Two:

- a) Electron transport chain in chloroplast.
- b) ATP synthesis.
- c) Metabolic changes during fruit ripening.

***P.T.O.***

## **SECTION - II**

**Q5)** Give an account of Alkaloid biosynthesis pathway.

**Q6)** Discuss:

- a) Redox potential and activation energy.
- b) Biological nitrogen fixation.

**Q7)** Explain:

- a) Ramchandran plot.
- b) Biosynthesis of starch.

**Q8)** Write notes on Any Two:

- a) Factors affecting enzyme activity.
- b)  $\beta$  - oxidation of fats.
- c) Classification of Amino acids & proteins.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1260**

**[5436]-13**

**M.Sc. - I**

**BOTANY**

**BO - 1.3 : Genetics and Plant Breeding  
(2008 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer any five questions, taking at least two questions from each section.*
- 2) *Answer to the two sections should be written in SEPARATE answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn WHEREVER necessary.*

**SECTION - I**

**Q1)** What is gene mapping? Explain the mechanism of ordered tetrad analysis in Neurospora.

- Q2)** a) Explain mechanism of cytoplasmic male sterility.  
b) Give an account on Hardy-Weinberg equation.

**Q3)** Explain:

- a) Inhibitory gene interaction with example.
- b) Inheritance of corolla length in Nicotiana.

**Q4)** Write note on any two:

- a) Chloroplast genome
- b) B-Chromosome
- c) Post - Mendelian genetics

**P.T.O.**

## **SECTION - II**

**Q5)** Give an account on mechanism of action of physical & chemical mutagens.

**Q6)** a) Discuss on genetic diversity in plants.

b) Write on incompatibility.

**Q7)** Explain:

a) Genetic basis of breeding.

b) Role of mutation in plant breeding.

**Q8)** Write note on any two:

a) Karyotypes

b) Plant breeding in India

c) Hybridization & its role



Total No. of Questions : 8]

SEAT No. :

**P1261**

[Total No. of Pages : 2

**[5436]-21**

**M.Sc. - I**

**BOTANY**

**BO - 2.1 : Systematics of Vascular Plants**

**(2008 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer any five questions, taking atleast two questions from each section.*
- 2) *Answer to the two sections should be written in separate answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagram must be drawn whenever necessary.*

**SECTION - I**

**Q1)** Describe structure of gametophyte and sporophyte of ophioglossales. [16]

**Q2)** Draw and describe external and internal morphology of sporophyte and gametophyte of cycadales. [16]

- Q3)** a) Comment on salient features of Angiosperms.  
b) Describe merits and demerits of Takhtajan system.

[16]

**Q4)** Write short notes on any two of the following :

[16]

- a) Psilotales
- b) Heterospory
- c) Tools of Taxonomy

**SECTION - II**

**Q5)** Justify gymnosperm as prospective ancestor of angiosperms. [16]

- Q6)** a) Write on Taxonomic hierarchy.  
b) Give affinities of Ginkgoales with cycadales.

[16]

**P.T.O.**

- Q7)** a) Give salient features of Welwitschiales.  
b) Describe conservation and utilisation of diversity of Angiosperm.

**[16]**

**Q8)** Write short notes on any two of the following :

**[16]**

- a) Ecad and Ecotypes  
b) Pollination in gymnosperms  
c) Palynology





Total No. of Questions : 8]

SEAT No. :

**P1262**

[Total No. of Pages : 2

**[5436]-22**

**M.Sc. - I**

**BOTANY**

**BO - 2.2 : Cell Biology and Instrumentation  
(2008 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt a total of five questions from the following, selecting at least two questions from each section.*
- 2) *Answers to the questions from each section should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Describe the ultrastructure of endoplasmic reticulum and add a note on its functions. **[16]**

**Q2)** a) Describe properties and organization of cytoplasmic matrix. **[8]**

b) Explain structure of chromosome. **[8]**

**Q3)** a) Give the working of uv-vis spectrophotometer. **[8]**

b) Comment on the role of photoproteins in cell signaling in plants. **[8]**

**Q4)** Write explanatory notes on ANY TWO of the following : **[16]**

a) Dosage compensation

b) Ultrastructure of plasma membrane

c) Ultracentrifugation

**P.T.O.**

## SECTION - II

- Q5)** Describe the construction and working of compound microscope. [16]
- Q6)** a) Explain in brief plant wound signaling pathway. [8]  
b) Give ultrastructure of nucleus. Add a note on its functions. [8]
- Q7)** a) Explain the concept of 'apoptosis'. [8]  
b) Describe various types of plastids. [8]
- Q8)** Write explanatory notes on any two of the following : [16]
- a) Ribosomes
  - b) Giant chromosomes
  - c) Phase contrast microscope.



Total No. of Questions : 8]

SEAT No. :

**P1263**

[Total No. of Pages : 2

[5436]-23

**M.Sc. (Part - I)**

**BOTANY**

**BO - 2.3 : Molecular Biology and Genetic Engineering**

**(2008 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt a total of five questions, selecting at least two questions from each section.*
- 2) *Answers to the questions from each section should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labeled diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** What is transcription? Describe in detail the structure of transcription apparatus in eukaryotes. **[16]**

**Q2)** a) Discuss the structure of prokaryotic gene. **[8]**

b) Explain the rolling circle model of DNA replication in prokaryotes. **[8]**

**Q3)** a) Write on positive and negative control of Lac operon. **[8]**

b) State the role of chaperones in the folding and processing of proteins. **[8]**

**Q4)** Write explanatory notes on any two of the following. **[16]**

a) Recombination repair.

b) Tryptophan operon.

c) Targetting of organelle proteins.

**SECTION - II**

**Q5)** What is DNA reassociation kinetics? Explain moderately repetitive and highly repetitive classes of DNA. **[16]**

***P.T.O.***

- Q6)** a) Explain structure of Ri plasmid. [8]  
b) Give the structure and properties of any one plasmid used as a cloning vector. [8]
- Q7)** a) Write in brief the concept of c-DNA libraries. [8]  
b) What is DNA cloning? Explain the role of various enzymes used for DNA cloning. [8]
- Q8)** Write explanatory notes on any two of the following. [16]  
a) Direct gene transfer in plants.  
b) Restriction mapping.  
c) Bioinformatics.



Total No. of Questions : 8]

SEAT No. :

**P1264**

**[5436]-31**

[Total No. of Pages : 2

**M.Sc.-II**

**BOTANY**

**BO-3.1 : Developmental Botany and Plant Tissue Culture  
(2008 Pattern) (Semester-III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Answer any five questions taking at least two questions from each section.*
- 2) Answer to the two sections should be writtern in seprate answer books.*
- 3) All questions carry equal marks.*
- 4) Neat labelled diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** What is fertilization? Explain double fertilization and triple fusion in Angiosperm. **[16]**

**Q2)** a) Write on megasporogenesis **[8]**

b) Comment on cell-cell interaction during plant development **[8]**

**Q3)** Write short answers of followings. **[16]**

a) Explain the concept of cell fate mapping and cell lineage

b) Write on importance of hormonal signaling during plant development

**Q4)** Write short notes on any two of the following. **[16]**

a) Programmed cell death

b) Juvenility

c) Polarity & Symmetry

**P.T.O.**

## SECTION-II

**Q5)** What is organogenesis? Explain direct and indirect organogenesis [16]

**Q6) a)** Give an account of somatic hybridization [8]

b) Write an role of PGRS in PTC. [8]

**Q7)** Write short answer of following. [16]

a) Give an account of somaclonal variations.

b) Comment on haploid production.

**Q8)** Write short notes on any two of the following. [16]

a) GM Crops

b) Cybrids

c) Application PTC in Agriculture

✓   ✓   ✓

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P1265**

**[5436] - 32**

**M.Sc. - II**

**BOTANY**

**Bo - 3.2 : Environmental Botany and Plant Diversity  
(2008 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *Answer any five questions, taking, at least two questions from each section.*
- 2) *Answer to the two sections should be written in SEPERATE answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn WHEREVER necessary.*

**SECTION - I**

**Q1)** What is water pollution? Give its types and sources. Add a note on eutrophication. **[16]**

**Q2)** a) Comment on ecological succession with its types and mechanism. **[8]**

b) Give concept of biosphere and add a note on GPS. **[8]**

**Q3)** Write short answers of the following.

a) Describe phytogeographic regions of India. **[8]**

b) Comment on population growth and its limits. **[8]**

**Q4)** Write short notes on any two of the following. **[16]**

a) Physiognomy.

b) Acid - rain.

c) Global warming.

***P.T.O.***

## SECTION - II

**Q5)** What is EIA? Give its scope, process and necessity in thermal study. [16]

**Q6)** a) Define biodiversity. Give concept and types of biodiversity. [8]

b) Comment on heavy metal pollution and add a note on its effects. [8]

**Q7)** Write short answers of the following.

a) What is photo-accumulation in remediation of waste water with examples. [8]

b) Comment on grassland ecosystem. Add a note on its biotic and abiotic components. [8]

**Q8)** Write short notes on any two of the following. [16]

a) Biogeochemical cycles.

b) Ecological pyramids.

c) CBD.





Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

**P1266**

**[5436]-34**

**M.Sc. -II**

**BOTANY**

**BO-3.32: Mycology and Plant pathology-I  
(2008 Pattern) (Semester-III) (Special Paper-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt total of five questions from the following. Select at least two questions from each section.*
- 2) *Answer to the questions from each section should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** Mention general characters of fungi and give an account of Ainsworth's system of fungi classification. **[16]**

**Q2)** Answer the following:

- a) Comment on plasmodiophoromycetes. **[8]**
- b) Explain sporangia to conidia evolution in mucorales. **[8]**

**Q3)** a) Discuss fruit body pattern in Ascomycotina. **[8]**

b) Write briefly on smut fungi **[8]**

**Q4)** Write short notes on (any two). **[16]**

- a) Lichen thallus.
- b) Algal and protozoan ancestra of fungi.
- c) Flagellated fungi

**P.T.O.**

## SECTION-II

**Q5)** Explain ruderal and stress tolerant colonisation strategies in fungi. **[16]**

**Q6)** Answer the following:

a) How fungi are symbiotically associated with higher plants? **[8]**

b) Comment on soil fungi. **[8]**

**Q7)** a) Discuss genetical aspects of pathogenicity, host resistance and virulence. **[8]**

b) Write briefly on fungal habitats. **[8]**

**Q8)** Write short notes on (any two). **[16]**

a) Heterothallism.

b) Mycotoxins

c) Air borne fungi.



Total No. of Questions :8]

SEAT No. :

**P1267**

**[5436]-35**

[Total No. of Pages : 2

**M.Sc.**

**BOTANY**

**BO-3.33: Angiosperms -I**

**(2008 Pattern) (Semester-III) (Special Paper-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt any five questions. Select at least two questions from each section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** Give an account of any two botanical gardens of the world. **[16]**

**Q2)** Explain: **[16]**

- a) Botanical gardens as multipurpose institute.
- b) Role of Herbarium in research.

**Q3)** a) Give aims and objectives of biosystematic investigation.

- b) Describe the multidisciplinary approach of systematics.

**[16]**

**Q4)** Write short notes on (any two):

**[16]**

- a) Major herbaria in the world
- b) Typification
- c) Effective and valid publication

**P.T.O.**

## SECTION-II

**Q5)** Give the floristic composition of the world with special reference to Biodiversity of angiosperms. **[16]**

**Q6)** Explain : **[16]**

- a) Effective characters of embryology in systematics.
- b) Primitive features of Ranunculaceae.

**Q7)** Describe the method for biosystematics investigation. **[16]**

**Q8)** Write short notes (any two): **[16]**

- a) Santalaceae
- b) Utility of anatomical characters in systematics
- c) Digital Herbarium



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1268**

**[5436]-36**

**M.Sc. - II**

**BOTANY**

**BO - 3.34 : Plant Physiology - I**  
**(2008 Pattern) (Special Paper - I) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Attempt any five questions, taking at least two questions from each section.*
- 2) Answer to the two sections should be written in separate answer book.*
- 3) All questions carry equal marks.*
- 4) Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1) What is stress? Discuss on abiotic stress. [16]**

**Q2) a) Explain the mechanism of flooding tolerance in plants. [8]**

**b) Comment on Saline-alkaline and sodic soils. [8]**

**Q3) a) Discuss the drought resistance mechanism in plants. [8]**

**b) Comment on effect of salt stress on plant metabolism. [8]**

**Q4) Write note on any two : [16]**

**a) Stress induced proteins.**

**b) Causes of water logging.**

**c) Scope of stress physiology.**

**P.T.O.**

## SECTION - II

**Q5)** What is Xenobiotic stress? Describe the effects of pollutants on plant metabolism. **[16]**

**Q6) a)** What are the effects of free radicals on plant growth? **[8]**

b) Explain the effects of Zn on plant metabolism. **[8]**

**Q7) a)** Describe the effects of UV-A radiation on plant metabolism. **[8]**

b) Give an account of photoinhibition. **[8]**

**Q8)** Write note on any two : **[16]**

a) Importance of Xenobiotic stress study.

b) Radiation stress.

c) Generation of ROS.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1269**

**[5436]-37**

**M.Sc. - II**

**BOTANY**

**BO - 3.35 : Genetics, Molecular Biology & Plant Breeding - I  
(2008 Pattern) (Special Paper - I) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Attempt any five questions taking at least two questions from each section.*
- 2) Answer to the two sections should be written in separate answer book.*
- 3) All questions carry equal marks.*
- 4) Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Explain mechanism of genetic recombination in bacteria. **[16]**

**Q2)** a) Comment on alien gene transfer method in Wheat crop. **[8]**

b) Describe production of auto polyploids. **[8]**

**Q3)** Explain :

a) Special types of chromosomes. **[8]**

b) Relationship of genetics to other areas of biology. **[8]**

**Q4)** Write notes on any two : **[16]**

a) Genetic Markers.

b) BAC.

c) Transmission genetics.

*P.T.O.*

## SECTION - II

**Q5)** Explain methods of hybrid seed production using cytoplasmicgenic male sterility in crop plants. **[16]**

**Q6) a)** Discuss on completely randomized Block design. **[8]**

b) Comment on Screening of mutants in crop plants at various levels. **[8]**

**Q7)** Explain :

a) Role of simple correlation method in crop improvement. **[8]**

b) Chi-square method with more than one degree of freedom. **[8]**

**Q8)** Write note on any two : **[16]**

a) Null hypothesis.

b) Production of hybrid seeds.

c) Objectives of plant breeding.





Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

**P1270**

**[5436]-38**

**M.Sc. -II**

**BOTANY**

**BO-3.36: Plant Biotechnology -I**

**(2008 Pattern) (Semester-III) (Special Paper-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt a total of five questions. Select at least two questions from each section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** What are objectives of plant tissue culture? Add a note on meristem culture. **[16]**

**Q2)** Answer the following:

- a) What is somatic embryogenesis? **[8]**
- b) Comment on haploids in agriculture. **[8]**

**Q3)** a) Give importance of cryopreservation. **[8]**

- b) Write on Green House technology. **[8]**

**Q4)** Write short notes on (any two). **[16]**

- a) SCP.
- b) Stress tolerance by transgenics
- c) Micropropagation.

**P.T.O.**

## SECTION-II

**Q5)** What are biofertilizers? Add a note on BGA. **[16]**

**Q6)** Answer the following:

a) Write briefly on phyto remediation. **[8]**

b) Comment on mycorrhizae biofertilizers. **[8]**

**Q7)** a) State the role of growth regulators in tissue culture. **[8]**

b) Comment on somaclonal variation. **[8]**

**Q8)** Write short notes on (any two). **[16]**

a) Methods of cryopreservation.

b) Morphogenesis.

c) Axillary bud culture.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1271**

**[5436]-39**

**M.Sc. - II**

**BOTANY**

**BO - 3.37 : Plant Biodiversity - I**  
**(2008 Pattern) (Special Paper - I) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt any five questions taking at least two questions from each section.*
- 2) *Answers to the two sections should be written in separate answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Give an overview of variety of life forms. Add a note on Global distribution of biodiversity. **[16]**

**Q2)** Comment on : **[16]**

- a) Concept and scope of Biodiversity.
- b) Genetic diversity Vs Transgenic organisms.

**Q3)** Explain : **[16]**

- a) Techniques of monitoring plant and fish biodiversity.
- b) Biodiversity of India.

**Q4)** Write notes on any two of the following : **[16]**

- a) Temperate Forest Ecosystem.
- b) Darwinian Evidence for natural selection.
- c) Comparison of species diversity of different sites.

**P.T.O.**

## SECTION - II

**Q5)** Describe Angiosperm and Lichen diversity w.r.t. habit, habitat distribution and evolutionary success. **[16]**

**Q6)** Explain : **[16]**

- a) Marine Ecosystems.
- b) Dispersal and diversification diversities in domesticated species.

**Q7)** Comment : **[16]**

- a) Algal diversity w.r.t. number of species habit, habitat distribution and evolutionary success.
- b) Artic and Alpine Ecosystems.

**Q8)** Write notes on any two of the following : **[16]**

- a) Classification of Ecosystems.
- b) Problems in inventorying species.
- c) Origin of species.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1272**

**[5436]-40**

**M.Sc. - II**

**BOTANY**

**BO - 3.38 : Seed Technology - I**  
**(2008 Pattern) (Special Paper - I) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt any five questions taking at least two questions from each section.*
- 2) *Answer to the two sections should be written in separate answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Give an account of development and structure of male gametophyte. **[16]**

**Q2)** a) Describe factors affecting seed germination. **[8]**

b) Explain methods of breaking seed dormancy. **[8]**

**Q3)** a) Give economic importance of seed borne diseases. **[8]**

b) Discuss relevance of dormancy to seed production. **[8]**

**Q4)** Write notes on any two of the following : **[16]**

a) Goal and opportunities of seed technology.

b) Chemical composition of seed.

c) Seed quality characteristics.

*P.T.O.*

## SECTION - II

**Q5)** Give an account of life cycle pattern of sugarcane pest. Add a note on its control measure. **[16]**

**Q6) a)** Comment on preventive measures of seed deterioration. **[8]**

b) Give general principles of seed storage. **[8]**

**Q7) a)** Discuss insect as a vector for plant diseases. **[8]**

b) Explain seed health testing methods. **[8]**

**Q8)** Write notes on any two of the following : **[16]**

a) Cold storage.

b) quarantine for seed.

c) Seed longevity.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 1

**P1273**

**[5436]-41**

**M.Sc.**

**BOTANY**

**BO - 4.1 : Plant Resources and Evolution**

**(2008 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer any five questions taking atleast two questions from each section.*
- 2) *Answer to the two sections should be written on separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat labelled diagram must be drawn whenever necessary.*

**SECTION - I**

**Q1)** Explain the methods of phytochemical investigation of secondary metabolites.

**Q2)** Justify “Chemotaxonomy is useful tool in criminology”.

**Q3)** Explain

- a) Therapeutic use of different parts of plants.
- b) Phytochemical investigation by Advance techniques.

**Q4)** Write note (any two)

- a) Plant as source of timber
- b) Secondary metabolites
- c) Gums, resins and dyes

**SECTION - II**

**Q5)** Describe Lamarckism concept of evolution. Add note on Natural selection.

**Q6)** Comment on evolution of eukaryotic cell.

**Q7)** Explain :

- a) Origin of new genes and proteins
- b) Protein and nucleotide sequence analysis.

**Q8)** Write note (any two) :

- a) Convergent evolution
- b) Spontaneous mutation
- c) Evolutionary time scale



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1274**

**[5436]-42**

**M.Sc. - II**

**BOTANY**

**BO - 4.2 : Applied Botany**

**(2008 Pattern) (Old Course) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Answer any five questions, taking atleast two questions from each section.*
- 2) Answer to the two sections should be written in separate answer books.*
- 3) All questions carry equal marks.*
- 4) Neat labelled diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Describe in detail mass production of Spirulina. Add a note on its nutritive value.

**Q2)** a) Give the role of fungi in production of biomolecules.

b) What is X<sup>2</sup>-test. Add a note on its applications.

**Q3)** a) Explain the role of fungi in bioremediation.

b) Give an account of role of algae as indicators of water quality.

**Q4)** Write explanatory notes on ANY TWO of the following :

a) Fungi as mycoweedicide

b) BGA & its commercial applications.

c) Fungal Allergy

**P.T.O.**



## SECTION - II

- Q5)** a) Explain role of mycorrhizal fungi in Agriculture.  
b) What is ANOVA? Write a note on its significance.

**Q6)** What are measures of central tendency? Explain Arithmetic mean and mode with suitable example.

- Q7)** a) Scope of Bioinformatics : Discuss.  
b) t-test : Comment on.

**Q8)** Write notes on ANY TWO :

- a) Non-Parametric statistics
- b) Fungi in Ayurvedic medicine
- c) Fungi in paper industry



Total No. of Questions : 8]

SEAT No. :

**P1275**

[Total No. of Pages : 2

[5436]-44

M.Sc. - II

**BOTANY**

**BO 4.42 : Mycology and Plant Pathology - II  
(2008 Pattern) (Semester - IV) (Special Paper - II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt a total of five questions from following, select atleast two questions from each section.*
- 2) *Answers to the questions form each section should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*

**SECTION - I**

- Q1)** State difference between primary and secondary metabolites. Explain submerged and shallow fermentation. [16]
- Q2)** a) Discuss in detail organic acid fermentation. [8]  
b) Write on antitumour and antiviral agents from fungi. [8]
- Q3)** a) Comment on fermented food of fungal origin. [8]  
b) Explain types of mycorrhiza. [8]
- Q4)** Write notes on any two. [16]  
a) Fungi in biocontrol  
b) Fungi in homeopathy and ayurvedic medicines.  
c) White rot fungi in bioremediation.

**P.T.O.**

**SECTION - II**

**Q5)** Discuss with suitable example mycetoma. Write briefly on cryptococosis. [16]

**Q6) a)** Briefly write on useful activities of fungi. [8]

b) Comment on pathogenesis. [8]

**Q7) a)** Write role of biotechnology in plant pathology. [8]

b) Comment on downy mildews and white rusts. [8]

**Q8)** Write explanatory notes on any two of the following. [16]

a) Contributions of any four mycologists.

b) Physiology of diseased plant

c) Smuts and bunts.



Total No. of Questions : 8]

SEAT No. :

**P1276**

**[5436]-45**

[Total No. of Pages : 2

**M.Sc. - II**

**BOTANY**

**BO 4.43 : Angiosperms - II (Special Paper - II)  
(2008 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Answers any five questions, taking at least two questions from each section.*
- 2) Answer to the two sections should be written in SEPARTE answer book.*
- 3) All questions carry equal marks.*
- 4) Neat diagram must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Give an account of experimental & applied palynology.

**Q2)** What is arboretum? Discuss the organization, function & importance of arboretum.

**Q3)** Explain-

- a) Structure of wood elements.
- b) Androgenesis.

**Q4)** Write notes on any two.

- a) In vitro fertilization
- b) Ultrastructure of any one wood element.
- c) Properties & uses & woods.

***P.T.O.***

## SECTION - II

**Q5)** Give an account of gross structure & organization of wood.

**Q6)** What is polyembryony? Give details of embryogenesis.

**Q7)** Explain :

- a) Pollen biochemistry.
- b) Somatic embryogenesis.

**Q8)** Write notes on Any Two:

- a) Agro forestry
- b) Ultrastructure & pollen
- c) Bee forage plants.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1277**

**[5436]-46**

**M.Sc. - II**

**BOTANY**

**BO - 4.44 : Plant Physiology - II (Special Paper - II)**

**(2008 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Answers any five questions, taking at least two questions from each section.*
- 2) Answers to the two sections should be written inseparate answer book.*
- 3) All questions carry equal marks.*
- 4) Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Discuss the effect of elevated level of CO<sub>2</sub> and O<sub>2</sub> on net assimilation rate and plant metabolism. **[16]**

**Q2)** Explain the mechanism of biosynthesis and degradation of chlorophyll. **[16]**

**Q3)** a) Explain the effect of global warming on plant metabolism. **[8]**  
b) Give an account of depletion of ozone layer and its effect on crop yield. **[8]**

**Q4)** Write notes on any two: **[16]**

- a) Recent research on crop physiology.
- b) Role of carotenoids in plant.
- c) Photochemical reaction.

**SECTION - II**

**Q5)** Describe, how fungal and bacterial infection affect plant metabolism. **[16]**

**P.T.O.**

**Q6)** Explain the defence mechanism developed in Bt-cotton & Bt-Brinjal against insect. [16]

**Q7) a)** Give photochemical and biochemical properties of phytochrome. [8]

b) Comment on effect of allelochemicals on crop productivity under monoculture. [8]

**Q8)** Write notes on Any Two: [16]

a) Photoperiodism and its significance.

b) Structural defence.

c) Bt-tomato.



Total No. of Questions :8]

SEAT No. :

**P1278**

**[5436]-47**

[Total No. of Pages : 2

**M.Sc.**

**BOTANY**

**BO-4.45: Genetics, Molecular Biology and Plant Breeding-II  
(2008 Pattern) (Semester-IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt a total of five questions from the following, Selecting at least two questions from each section.*
- 2) *Answers to the questions from each section should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labeled diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** What are molecular markers? Describe RFLP and RAPD in detail. Write a note on its applications. **[16]**

**Q2)** a) Explain mechanism of genetic mapping. **[8]**

b) Describe method of colony hybridization. **[8]**

**Q3)** a) Discuss method of southern blotting . **[8]**

b) Write an account on concept of genomic libraries. **[8]**

**Q4)** Write notes on any two of the following: **[16]**

a) Chromosome walking

b) Organelle genome

c) Gene-environment interactions.

**P.T.O.**



## SECTION-II

**Q5)** Give an account of breeding for nutritional quality with reference to protein. **[16]**

**Q6)** a) Describe procedure for the production of somaclonal variants. **[8]**

b) Explain, Importance of crop management. **[8]**

**Q7)** a) Comment on relationship between drought resistance traits and yield characters. **[8]**

b) Give importance of genetic engineering in breeding techniques. **[8]**

**Q8)** Write explanatory notes on any two of the following: **[16]**

a) QTL

b) Genome size

c) DNA sequencing



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

**P1279**

**[5436]-48**

**M.Sc. II**

**BOTANY**

**BO - 4.46: Plant Biotechnology-II  
(2008 Pattern) (Semester-IV) (Paper-II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt any five questions selecting at least two questions from each section*
- 2) *Answers to the questions from each section should be written in separate answer books.*
- 3) *Neat labeled diagrams must be drawn wherever necessary.*
- 4) *All questions carry equal marks.*

**SECTION-I**

- Q1)** Explain chemical & enzymatic method of DNA sequencing. **[16]**
- Q2)** a) Write comparative account of structural & functional genomics. **[8]**  
b) Comment on public acceptance of agrobioproduct. **[8]**
- Q3)** a) Discuss western blotting technique. Write its uses. **[8]**  
b) Mention any four enzymes & their uses in recombinant DNA technology. **[8]**
- Q4)** Write notes on any two of the followings: **[16]**
- a) Bioethics
  - b) DNA libraries
  - c) Use of biotechnology in wastewater treatment.

**P.T.O.**

## SECTION-II

- Q5)** Explain various strategies & methodologies of proteomics. **[16]**
- Q6)** a) Write about any two vectors & their selection methods. **[8]**  
b) Enumerate the steps in PCR. Write its applications. **[8]**
- Q7)** a) Describe any two strategies for whole genome analysis. **[8]**  
b) Discuss applications of proteomics in characterization of novel proteins. **[8]**
- Q8)** Write notes on any two of the followings: **[16]**
- a) Chromosome jumping.
- b) Techniques in restriction mapping.
- c) Agricultural Biotechnology.



Total No. of Questions :8]

SEAT No. :

**P1280**

**[5436]-49**

[Total No. of Pages : 2

**M.Sc. -II**

**BOTANY**

**BO 4.47: Plant Biodiversity (Special Paper-II)  
(2008 Pattern) (Semester-IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer any five questions, taking at least two questions from each section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagram must be drawn wherever necessary.*

**SECTION-I**

**Q1)** Explain the factors affecting ecosystem degradation and loss. Add a note on reasons for loss of diversity of tropical forests. **[16]**

**Q2)** Give an account of the role of universities and other educational institutions in biodiversity conservation. **[16]**

**Q3)** Explain: **[16]**

- a) In-Situ conservation
- b) Biodiversity legislation and convention

**Q4)** Write explanatory notes on any two of the following: **[16]**

- a) Environmental protection Act.
- b) Demographic bottlenecks.
- c) Role of UNESCO and FAO in plant diversity Management

**P.T.O.**

## SECTION-II

**Q5)** Explain with suitable examples the advantages and limitations of use of biotechnologies in plant conservation. **[16]**

**Q6)** Explain the methodologies for evaluation of biodiversity. Add a note on ecotourism. **[16]**

**Q7)** Explain:

a) Emerging international policies. **[16]**

b) Economic value of biodiversity.

**Q8)** Write notes on any two of the following: **[16]**

a) Biopiracy.

b) Plant biodiversity as a source of carbon sinks.

c) Biological invasions and its ecological and economic impacts.



Total No. of Questions :8]

SEAT No. :

**P1281**

**[5436]-50**

[Total No. of Pages : 2

**M.Sc.**

**BOTANY**

**BO-4.48: Seed Technology**

**(2008 Pattern) (Semester-IV) (Special Paper-II) (Old)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Answer any Five questions selecting atleast two questions from each section.*
- 2) Answer to the two sections should be written in separate answer books.*
- 3) All questions carry equal marks.*

**SECTION-I**

**Q1)** Give brief account of seed production in wheat and tomato.

**Q2)** a) Explain seed village concept.

b) Describe construction and working of seed grader.

**Q3)** a) Give an account of true potato seed production.

b) Comment on construction and working of colour separators.

**Q4)** Write short notes on any two of the following:

a) RAPD and RFLP

b) Seed certification board.

c) DNA Finger printing.

**SECTION-II**

**Q5)** Explain general procedure for seed certification. Add a note on specific seed certification standards.

**Q6)** a) Comment on artificial seed production.

b) Describe construction and working of air screen cleaner.

***P.T.O.***

- Q7)** a) Give history and development of seed testing.  
b) Explain concept and objectives of seed processing.

**Q8)** Write short notes on any two of the following:

- a) Classes of seeds.  
b) Characteristics and importance of quality seed.  
c) Types of seed sampling.

